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Vocal handicap and coping strategy in dysphonia after laryngectomy

Desvantagem vocal e estratégias de enfrentamento nas disfonias após laringectomias

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ABSTRACT

Introduction: The laryngeal cancer treatment causes significant changes in the quality of life. **Purpose:** To assess and compare the vocal handicap and the coping strategies to deal with the vocal handicap resulting from supracricoid and total laryngectomy. **Methods:** Analytical, prospective observational study of groups of subjects with the same disease. Seventeen subjects were assessed and divided in two groups; the first with eight male subjects submitted to supracricoid partial laryngectomy, with cricohyoidoepiglottopexy, mean age of 67,5; and a second group with nine subjects, two women and seven men, submitted to total laryngectomy, mean age of 64,3. All subjects answered the Vocal Handicap Index-10 (VHI-10) and the Coping Strategies in Dysphonia Protocol (PEED-27). **Results:** The mean values of raw scores obtained with the VHI-10 by the two groups did not reveal significant differences, matching studies involving dysphonic patients. Both groups use an elevated number of coping strategies for vocal problems: the first group presented mean raw scores of 65,75 and the second group, 59,22. **Conclusion:** The comparison between subjects submitted to supracricoid laryngectomy and total laryngectomy does not evidence differences concerning the self-assessment of voice, vocal handicap and coping strategies to deal with vocal problems. Both groups use more than the double of coping strategies for vocal problems, with a predominant focus on emotion.

Keywords: Voice; Dysphonia; Quality of life; Laryngectomy; Self concept

RESUMO

Introdução: O tratamento para o câncer de laringe acarreta mudanças significativas na qualidade de vida. **Objetivo:** Avaliar e comparar a desvantagem vocal e as estratégias de enfrentamento para lidar com o comprometimento vocal resultante de laringectomias supracricoide e total. **Métodos:** Foram avaliados 17 sujeitos, divididos em dois grupos, sendo um com oito sujeitos, todos do gênero masculino, que se submeteram à laringectomia parcial supracricoide, com cricohioidoepiglotopexia, média de idade 67,5 anos, e um segundo grupo com nove sujeitos, sendo duas mulheres e sete homens, que se submeteram à laringectomia total, média de idade 64,3 anos. Todos responderam às questões do protocolo Índice de Desvantagem Vocal-10 (IDV-10) e do Protocolo de Estratégias de Enfrentamento na Disfonia (PEED-27). **Resultados:** Os valores médios dos escores brutos obtidos no IDV-10, nos dois grupos, não revelaram diferenças, sendo os índices de desvantagem compatíveis com estudos de vozes disfônicas de diferentes tipos. Ambos os grupos utilizavam um número elevado de estratégias de enfrentamento do problema de voz. O primeiro grupo apresentou 65,75 como média de escores brutos e o segundo, 59,22. **Conclusão:** A comparação entre sujeitos que se submeteram a laringectomia supracricoide e aqueles submetidos à laringectomia total não evidenciou diferenças, no que se refere à autoavaliação da voz, desvantagem vocal e estratégias de enfrentamento do problema de voz. Os dois grupos utilizavam mais que o dobro de estratégias de enfrentamento do problema de voz, com predomínio de foco na emoção.

Palavras-chave: Voz; Disfonia; Qualidade de vida; Laringectomia; Autopercepção

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INTRODUCTION

Supracricoid partial laryngectomy (SCPL) has been pointed out as advantageous when compared to total laryngectomy (TL), especially considering that it aims to preserve part of the organ[1,2,3,4,5,6,7]. Survival rates of SCPL are similar to the TL ones[6,8], although it may benefit the patient by not using permanent tracheostomy. The vocal quality after SCPL is characterized as hoarse and breathy[2], however intelligible, allowing the patient to keep an effective voice for his communication[1] and has low impact on social activities, contributing for a better quality of life[1,3,4,5,9,10].

The TL, however, is still one of the main procedures in the treatment of laryngeal cancer and the patient needs to learn a new way of verbal communication and deal with breathing and swallowing changes, which will certainly interfere in his life[11].

Regardless the chosen surgical modality, the larynx cancer treatment results in changes in patient's daily life activities, significantly altering its quality[12,13] and jeopardizing primordial functions of social life[8,13,14] in which voice plays a prominent role.

The quality of life (QoL) may be considered as the way an individual deals satisfactory or unsatisfactory with several aspects of his daily life, considering his wellbeing, beliefs, personal and spiritual satisfactions[12,15,16]. The assessment process may involve four main domains: physical and psychological functioning, social interaction and symptoms related to the disease treatment[15].

The way the patient deals with the disease significantly influences the treatment and results[17,18]. He will have to deal with the laryngectomy impairments, requiring coping. It is vital that the patient makes an effort to face the situation in order to reestablish the appropriate psychic balance[19].

This study aimed to assess and compare the vocal handicap and coping strategies in two groups of patients, after supracricoid partial laryngectomy and after total laryngectomy.

METHODS

This analytical, descriptive, prospective open study assessed 17 subjects with the same disease divided in two groups. The first group comprised eight patients submitted to SCPL with cricohyoidoepiglottopexy (CHEP), all male ranging in age from 55 to 76 years, mean age of 67,5 years. The second group comprised nine subjects submitted to TL, seven men and two women, ranging in age from 59 to 82 years, mean age of 64,3 years. Two subjects of this group used tracheoesophageal prosthesis, two used esophageal speech and two used electrolarynx.

All subjects attended the Speech Language Services of the Head and Neck Surgery Ambulatory of a private school-hospital in Campinas city (SP). All participants were retired, literate, with an average schooling of elementary school, complete or not.

At the time of the study, subjects were in process of assisted discharged and were considered as presenting functional communication, which was an inclusion criteria for the study. The mean post-surgical time of subjects submitted to SCPL was two years and two months and the mean post-surgical time of subjects submitted to TL was three years and six months. Most of the patients had unilateral or bilateral cervical emptying (five SCPL and seven TL), however it was not the focus of the study to compare such situation.

Eligible subjects were included in the study if they met the following criteria: undergone SCPL or TL; willingness to participate in the study; general health under control at the time of the study; no cancer recurrence or other impairments or morbidities interfering with quality of life, considering only the limitations due to the surgery for laryngeal cancer; retired or not; absence of dysphagia or adapted swallowing; not in use of feeding probe.

Subjects from both groups answered the Voice Handicap Index-10 (VHI-10)[20] and the Dysphonia Coping Strategy Protocol (PEED-27)[21]. All questions of the protocols were read by a researcher and subjects had to choose the answer according to his self-perception.

Material

The Vocal Handicap Index – 10 (VHI-10) is a shorter version of VHI, translated and adapted to Brazilian Portuguese[20]. VHI-10 was developed, maintaining the 10 most clinically relevant questions. The instrument produces a total single score arrived at by a summation of scores allocated to different responses to items/ questions that range from 0 to 40 points, with 0 indicating no disadvantage and 40 indicating maximum disadvantage. A study showed that the VHI-10 is a robust tool to evidence the impacts of dysphonia in the individual's life[22].

The Dysphonia Coping Strategy Protocol (PEED-27) was translated and into Brazilian Portuguese and validated[17]. It is a self-assessment instrument consisting of 27 items developed specifically to evaluating the strategies that people with voice disorders use to face their voice problem. The items are evaluated at a scale of 6 points that analyzes the frequency of use of the strategy. The score produced by the protocol can range from 0 to 135, with 0 indicating no use of strategies and 135, use of all strategies. The items of the questionnaire are categorized in two types of coping strategies, problem-focused and emotion-focused. Items 2, 4, 7, 8, 11, 13, 14, 24, 25 and 26 correspond to problem-focused strategies and are related to efforts used to modify the stress source. Emotion-focused strategies correspond to items 1, 3, 5, 6, 9, 10, 12, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 27 and are attempts to regulate emotional stress caused by the stressing agent

Ethical aspects

The study was approved by the Research Ethics Committee with Human Beings of the *Pontifícia Universidade Católica de Campinas*, Nº 394.430, CAAE 17671513.1.0000.5481. All subjects were informed about the study details and, after understanding the procedures that would be performed, they signed the informed consent term and kept a copy of it.

RESULTS

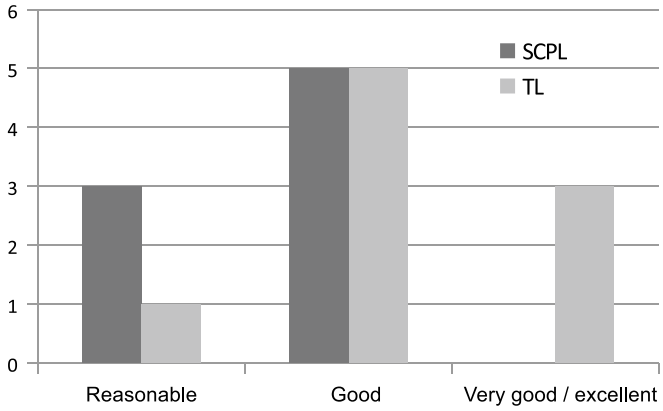
Subjects from the SCPL group evaluated their voices from reasonable to good, with predominance of good, and subjects from the TL group from reasonable to very good, also with predominance of good (Figure 1). The exact test of Fischer revealed p=0.385 in the comparison of both groups.

The averages obtained by the two groups regarding VHI-10 questions with their respective p values are presented in Table 1.

The average raw scores results of VHI-10 show that the SCPL group had average value of 9,0 and the TL group, 12,7 (Figure 2). Comparing the two groups regarding the raw average values of VHI-10, the Mann-Whitney/Wilcoxon test revealed p=0.175. Highlights to answers given to question O10 of the instrument -"People ask: what's wrong with your voice?", where p=0.024 (Figure 3).

The average raw scores obtained by SCPL and TL groups concerning PEED-27 protocol were 65,75 and 59,22, respectively. Comparing those scores, the Mann-Whitney/Wilcoxon test revealed p=0.359. Concerning the problem-focused domain, the value was p=0.101 and concerning the emotion-focused domain it was p=0.923 (Table 2).

Results of the PEED-27 protocol regarding both, problem-focused and emotion-focused strategies, are described in Tables 3 and 4.



Subtitle: SCPL = Group of subjects submitted to supracricoid partial laryngectomy; TL = Group of subjects submitted to total laryngectomy

Figure 1. Self-assessment of vocal quality performed by groups supracricoid partial laryngectomy and total laryngectomy

DISCUSSION

Results of this study showed that the SCPL group assessed their voices from reasonable to good, while in the TL group there were concepts of reasonable to very good. Attention is drawn to the tendency of both groups to make positive self-assessments, considering the extension of supracricoid partial laryngectomy, or even the total removal of the organ, which generates the laryngeal voice alaryngeal.

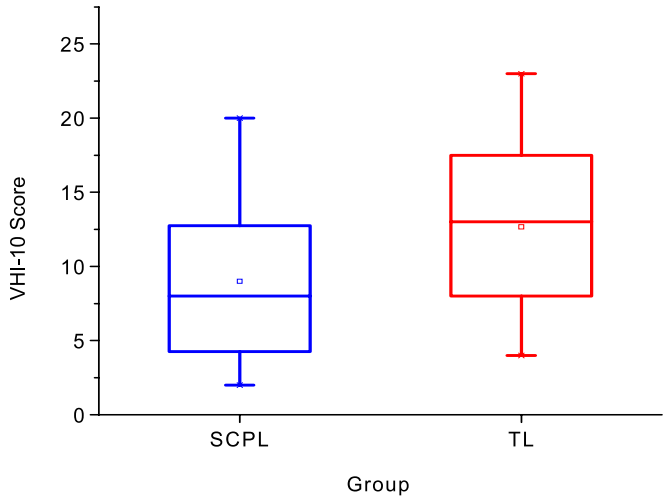
Previous studies confirmed the tendency of patients with dysphonia to assess their own voice as being of good quality after a partial laryngectomy[23]. One must take into account other factors that may be influencing such self-concept since laryngectomy surgeries, partial and total, severely alter the laryngeal structure, or remove part of the organ, jeopardizing the vocal quality intensively, or leading patients to seek for substitutive phonation with esophageal speech, tracheoesophageal prosthesis, etc.

Table 1. Results of Voice Handicap Index-10: averages obtained by subjects from supracricoid partial laryngectomy group and from total laryngectomy group

Questions	Averages		p-value*
	SCPL	TL	
F1 - My voice makes it difficult for people to hear me.	1.3	1.7	0.571
F3 - People have difficulty undestanding me in noisy rooms.	2.1	2.3	0.759
F16 - My voice problem restricts my social and personal life.	0.9	1.0	0.829
F19 - I feel left out of conversations because of my voice.	0.4	0.6	0.495
F22 - My voice problem causes me finantial loss.	0.4	1.1	0.299
O10 - People ask:> "What's wrong with your voice?"	1.1	2.2	0.024
O14 - I feel as though I have to strain to produce my voice.	1.6	0.8	0.138
O17 - I can't predict the clarity of my voice.	0.1	0.7	0.271
E23 - My voice problem upsets me.	0.4	0.9	0.396
E25 - My voice makes me feel handicapped.	0.8	1.4	0.414

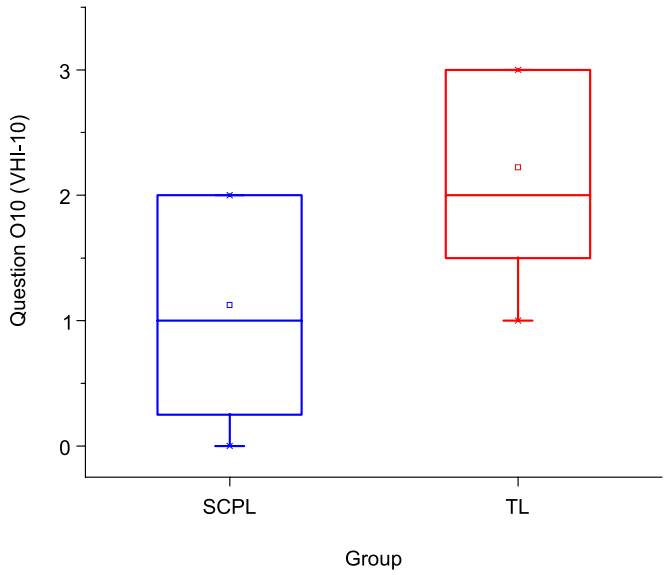
* Mann-Whitney/Wilcoxon test for the comparison of values between the groups

Subtitle: SCPL = Group of subjects submitted to supracricoid partial laryngectomy; TL = Group of subjects submitted to total laryngectomy



Subtitle: SCPL = Group of subjects submitted to supracricoid partial laryngectomy; TL = Group of subjects submitted to total laryngectomy

Figure 2. Results of the Vocal Handicap Index-10 raw scores averages obtained by the supracricoid partial laryngectomy and the total laryngectomy groups



Subtitle: SCPL = Group of subjects submitted to supracricoid partial laryngectomy; TL = Group of subjects submitted to total laryngectomy

Figure 3. Results of Question O10 of the Vocal Handicap Index-10: supracricoid partial laryngectomy and the total laryngectomy group averages

Table 2. Results of the Dysphonia Coping Strategies Protocol-27: averages obtained by groups regarding raw scores, problem-focused and emotion-focused domains

Scores	Averages of groups		p-value*
	SCPL	TL	
Raw	65.75	59.22	0.359
Problem-focused	23.13	17.22	0.101
Emotion-focused	42.63	42.00	0.923

* Mann-Whitney/Wilcoxon test for the comparison of values between the groups
Subtitle: SCPL = Group of subjects submitted to supracricoid partial laryngectomy; TL = Group of subjects submitted to total laryngectomy

Studies show divergences of opinions concerning vocal quality, considering that communication goes beyond an impaired voice[24,25,26]. Some authors defended the patients' satisfaction with their voice in the presence of an intelligible communication[4,24,27]. Others defended that the most affected aspect was communication, which is responsible for the worst impacts upon quality of life[8]. It is important to stress that, in this study, all patients had already gone through speech therapy, which may have contributed for adaptation strategies of the new voice and for a functional communication in both groups.

The HVI-10 average raw values obtained in both groups did not reveal difference, but showed compatibility with different types of voice impairment, corroborating a validation study of the HVI-10[22], in which the average values found for patients without vocal complaint were 1,0 and raw scores varying from 8,0 to 28,0 points for patients with functional dysphonia and vocal folds palsy. However, in the mentioned study there were no cases of dysphonia by larynx carcinoma and the scores found in the present study were lower than most of the dysphonia cases studied.

Only one question from the organic domain of the HVI-10 (O10) revealed difference between the two groups. The question "People ask: what's wrong with your voice?" revealed greater disadvantage to the TL group, which may be justified if considering the significant voice modification for the listener. In the TL group, most of the subjects used the tracheoesophageal prosthesis which seals the tracheostomy digitally when speaking, raising people's curiosity. The same may occur with the electronic larynx which also modifies the phonation source differing it from a laryngeal voice.

Concerning the elevated number of strategies used by both groups for coping with the vocal problem, results (Table 2) agree with those found in the study mentioned previously[22]. It may be emphasized that there were no differences between the average raw scores found in both groups, which is in agreement with a study that verified, using PEED-27, that subjects with vocal complaint used more than the double of coping strategies than the general population. According to the study, the average total score of the group with vocal complaint was 51,86 and of the general population it was 23,18[17].

Coping strategies are the result of cognitive and behavioral efforts used to manage internal and external demands under stressing circumstances, and the emotions caused by them[28]. In other words, they are used by an individual to deal with a problem that causes stress, trying to overcome it somehow[17,19,29].

Coping strategies vary according to personal experiences and may be emotion-focused or problem-focused. In the first case, there is a search to decrease the internal emotional discomfort sensation, and is used predominantly when there is a permanent impairment. In the second case, there is a search for direct changes in the environment that generated the stress and it is more used in situation that are possible to be changed.

Table 3. Averages of both groups obtained in each question of the problem-focused domain of the Dysphonia Coping Strategies Protocol-27

Questions	SCPL Group Averages	TL Group Averages	p-value
2. I try to avoid situations where my voice problem would become evident.	1.0	1.5	0.572
4. I try to find as much information as possible about my voice problem.	4.8	1.1	0.002**
7. I find talking with friends and family about my voice problem helpful.	1.8	3.3	0.152
8.I think it is easier to cope with my vocal disorder trying to understand it better.	3.9	2.8	0.191
11. I find it easier to live with my voice problem, if I do not use my voice	1.5	1.5	0.999
13. I find it is easier to cope with my vocal disorder when I ask questions to the doctor.	4.5	2.9	0.084*
14. I think it is easier to cope with my vocal disorder by avoiding being with others.	0.5	0.5	0.897
24. Resting my voice at times, helps me cope with my voice problem.	2.6	0.8	0.047*
25. I ask others for help because of my vocal disorder.	0.3	1.0	0.168
26. I try to become involved in as many physical activities as possible to take my mind off my voice problem.	2.4	1.1	0.346

* Significant values (p<0.05) – Mann-Whitney/Wilcoxon test for the comparison of values between the groups
Subtitle: SCPL = Group of subjects submitted to supracricoid partial laryngectomy; TL = Group of subjects submitted to total laryngectomy

Table 4. Averages of both groups obtained in each question of the emotion-focused domain of the Dysphonia Coping Strategies Protocol-27

Questions	SCPL Group Averages	TL Group Averages	p-value
1. It is easier to cope with my vocal disorder if other people are kind.	2.9	4.3	0.192
3. I find myself wishing that I never had a voice problem.	0.8	2.4	0.335
5. I find it easier to cope with my voice problem by expressing my feelings outwardly.	1.8	2.8	0.419
6. I find it easier to cope with my vocal disorder by avoiding thinking about it.	3.3	1.8	0.201
9. I keep to myself any concern about my vocal disorder.	2.6	2.1	0.460
10. I think there is not much I can do regarding my vocal disorder.	1.1	2.0	0.359
12. Having a vocal disorder helped me to understand some important facts about my life.	3.7	3.1	0.580
15. I find it easier to cope with my voice problem by wishing that it would go away somehow.	0.9	1.1	0.573
16. I find it easier to cope with my voice problem by joking about it.	0.3	2.0	0.007*
17. I try to accept my vocal disorder because there is nothing that can be done.	3.0	3.1	0.800
18. I think religion and praying help me cope with my voice problem.	4.3	3.0	0.171
19. I keep to myself the frustrations caused by my vocal disorder and a few friends know how I feel.	2.1	1.6	0.455
20. I try to convince myself that my voice problem is not really that disabling.	4.1	3.1	0.346
21. Having a voice problem has helped me to become a better person.	2.9	2.7	0.762
22. I ignore my voice problem looking only at good things in life.	3.6	3.4	0.443
23. When my voice gets bad, I find myself taking it out on others around me.	0.4	0.3	0.717
27. I find it easier to cope with my voice problem when I compare myself to others who have worse health problems than mine.	5.0	4.1	0.169

* Significant values (p<0.05) – Mann-Whitney/Wilcoxon test for the comparison of values between the groups
Subtitle: SCPL = Group of subjects submitted to supracricoid partial laryngectomy; TL = Group of subjects submitted to total laryngectomy

Both strategies occur when there is an increase in stress and mutually influence one another[28,30].

In the present study, both groups used more emotion-focused strategies and there were no statistical differences between the average scores. Essentially, one can say that subjects from both groups used the double of emotion-focused strategies (average for SCPL 42,73 and for TL 42,2) when compared to problem-focused strategies. Literature pointed out that problem-focused strategies are, usually, used by people who go through a "temporary" problem. Considering the emotion-focused strategies, the reverse occurs[29], which may have happened in the present study since, most likely, either the total or the partial larynx removal implicates in permanent loss of the organism's structure and function.

Concerning certain questions of the problem-focused domain, some differences were observed between the groups regarding the search for knowledge about the disease. The SCPL group differed from the TL group in the following questions: "I try to find all available information about my vocal disorder"; "I find it is easier to cope with my vocal disorder trying to understand it better"; "I find it is easier to cope with my vocal disorder when I ask questions to the doctor". Therefore, one may suppose a certain tendency of the SCPL group to search for strategies focused on efforts to manage or alter the problem[19].

Literature acknowledged that subjects use more problem-focused strategies in the presence of a "changeable" situation[28,30]. Although it was a punctual tendency, the propensity for using certain problem-focused strategies more expressively by the SCPL group than by the TL group may be justified by considering that SCPL subjects had more vocal adaptive possibilities than TL subjects, since the total larynx removal, the tracheostomy and the loss of vocal source are permanent.

Concerning questions related to emotion-focused coping strategies, the item "I find it easier to cope with my voice problem by joking about it" presented difference between the groups, being more used by the TL group. Many interpretations can be given to this fact. One may think that the unchangeable feature due to the total larynx removal, or even the communication ways (esophageal speech, electronic larynx or tracheoesophageal prosthesis), which are very different than the usual communication mode, make these individuals a constant target of social curiosity, leading them to develop this type of strategy.

According to literature, SCPL seems to be ideally suited to treat T1, T2 and T3 tumors and some selected T4 cases, when compared to TL. Its results have been satisfactory either for the preservation of the organ as for the functional benefits[1,2,3,4,5,6,7]. However, despite such reports, the subjects' vocal self-assessment and the analysis related to the vocal handicap did not reveal differences between both groups. The same happened regarding the vocal problem coping strategies.

CONCLUSION

The comparison of two groups of subjects submitted to supracricoid partial laryngectomy and total laryngectomy did not evidence difference regarding vocal self-assessment and vocal handicap aspects. Both groups used more than the double of vocal problem coping strategies when compared to the population without vocal complaint, with predominance of emotion-focused strategies. It is suggested that further studies should be developed to verify the impacts of both surgical resources.

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